YUKON DIAMOND RUMOR MAP

and NOTES

2002

Scott Casselman, B. Sc, P. Geo.
Aurora Geosciences Ltd.

Bill Harris
Midnight Mines Ltd.

Disclaimer: Information contained in this report and on the accompanying map was compiled from a variety of sources and is subject to verification. The authors make no warranty, expressed or implied as to the accuracy of the information contained in this report.

Yukon
Energy, Mines and Resources

TABLE OF CONTENTS

Introduction 1

Geological Setting of Selected Kimberlite / Lamproite Occurrences
- Mountain Diatreme, N.W.T. 2
- Shulin Lake Property Diamond Discovery, Alaska 2
- Xeno Property Diamond Discovery, British Columbia 3

Reported Diamond Occurrences 3

Reported Potential Diamond-Related Occurrences 7

Conclusions 9

Acknowledgment 9

References 10

Funding for this project was provided through the Yukon Regional Mineral Development Program of Department of Energy, Mines and Resources, Yukon Government

105-02249/

INTRODUCTION

Since the discovery of the diamond-bearing kimberlite pipes in the Northwest Territories in the early 1990s, there has been an extensive amount of capital invested in exploration and development in the search for diamonds. The focus of this investment has been predominantly in the N.W.T., however some of the exploration activity has spilled into nearly every province and territory in Canada. More than ten years after the discovery on Point Lake we can attribute to this investment an operating mine at Ekati, a soon to be operating mine at Diavik, a third mine in the feasibility and permitting stage at Snap Lake and a number of advanced-stage exploration projects.

Significant new discoveries continue to be made as exploration continues. In the spring of 2002, Vancouver-based Pacific Ridge Exploration Ltd announced the discovery of a diamond from a sample of kimberlitic material on the Xeno Property in northern British Columbia. At the same time, Calgary-based Golconda Resources Ltd and Edmonton-based Shear Minerals Ltd jointly announced the discovery of diamond-bearing tuffaceous "maar-like" rocks from their Shulin Lake Property north of Anchorage, Alaska.

Since the Klondike gold rush there have been a number of rumors of diamond finds in the Yukon and anecdotal evidence of diamond exploration activity and discoveries of kimberlite and lamproite. Most of the diamond finds were reported by placer miners, having discovered the glassy gems in their concentrate. Following the discovery of diamonds in the N.W.T. a few diamond exploration companies have quietly explored selected localities in the Yukon. However, during this time there has not been a documented occurrence of a diamondiferous kimberlite, lamproite or ultramafic rock in the territory. Despite this, there are discoveries being made to the south, east and west.

This report is a compilation of information on diamond discoveries and rumors of discovery in and around Yukon. The objective of the study was to assemble, in one source, all presently available information on diamond discoveries and potential diamondiferous host rock occurrences in the Yukon and surrounding regions of Alaska, N.W.T. and British Columbia. This information was derived from personal conversations with placer miners, prospectors, geologists and mining company executives, and from unpublished notes, media reports, government publications and assessment reports. The authors have not personally verified any of the diamond occurrences cited in this report.

GEOLOGICAL SETTING OF SELECTED KIMBERLITE/LAMPROITE OCCURRENCES

Mountain Diatreme, N.W.T.

The Mountain Diatreme is located 190 km southwest of Norman Wells, N.W.T., in the Mackenzie Fold Belt. It is a 600 m diameter kimberlite pipe intruding Upper Cambrian to Middle Ordovician silty limestone of the Rocky Mountain Assemblage. The diatreme contains xenocrysts of picroilmenite, pyrope and chrome-diopside, as well as microdiamonds. The pipe has a central core of dark green, mainly autolithic breccia with lesser xenoliths of country rock carbonates. The matrix is composed of chlorite, phlogopite and carbonate with minor amounts of serpentine, tremolite and opaque minerals (Normin Database). K-Ar dating of the phlogopite returned a date of 445±17 Ma for the kimberlite (Yukon Minfile).

The Mountain Diatreme was discovered in 1973 by Welcome North Mines Ltd and in 1976 they conducted geological mapping of the area. Later that year, the property was staked by Petra Gem Exploration Ltd. In 1977, Petra Gem "panned large amounts of weathered debris and alluvial material"(Yukon Minfile). No significant results were reported. In 1982, the property was transferred to C.F. Mineral Research Ltd. who, in 1983, signed a joint venture agreement with Superior Oil Ltd. The joint venture collected a number of samples of the diatreme with one 35 kg sample returning two 'very small' microdiamonds. Superior is also reported to have recovered 8 or 9 microdiamonds from surface outcrops interpreted to be part of the crater facies. The property was later allowed to lapse.

In 1996, Archer, Cathro and Associates conducted an exploration program in the area including collecting a 10 ton sample of the diatreme material. The sample, however, contained no diamonds and the property was allowed to lapse.

Shulin Lake Property Diamond Discovery, Alaska

In the summer of 2002, Golconda Resources Ltd. and Shear Minerals Ltd. announced the discovery of 15 micro-diamonds and one macro-diamond from 9.97 kg of drill core on their Shulin Lake property. The sample came from a depth of 175.0 - 185.6 m (574-609 feet) in hole 10 of an 11-hole drill program. The interval is described as a "maar-like sequence of interbedded volcaniclastic and tuffaceous rocks containing olivine and pyroxene." (Shear Minerals Press Release, July 8 2002). Six of the eleven holes intersected the tuffaceous horizon. The property is located 72 km north of Anchorage, Alaska.

The area is underlain by Tertiary sedimentary rocks of the Kenai Group. The Group is divided into two formations separated by an angular unconformity: the Pliocene Sterling Formation (gravel) and the sandstone, conglomerate and coal-bearing Miocene, Tyonek Formation. These rocks unconformably overly greywacke, shale and phyllite of the Jurassic-Cretaceous Kahiltna Formation.

Xeno Property Diamond Discovery, British Columbia

The Xeno Property is located at the northern end of Dall Lake, 175 kilometers south of Watson Lake, Yukon, in the Kechika Ranges of the Cassiar Mountains in British Columbia. The property was originally acquired to be explored for rare earth minerals associated with a mafic alkalic igneous complex. It is in Cassiar Terrane and is underlain by quartzite of the Lower Cambrian Atan Group, chlorite-sericite schist, phyllite, marble and dolostone of the Cambro-Ordovician Kechika Group and green siliceous tuff, chert, pink and black sandstone and argillite of the Ordovician to Silurian Sandpile Group.

The rare earth mineralization is hosted in an alkalic intrusive-extrusive igneous complex in the tuff-chert-limestone unit. The complex forms a west-northwest trending belt of probably cogenetic syenites, trachytic volcanics and carbonatites that has been mapped for at least 20 km and ranges in width from a few hundred meters to a few kilometers. At the south end of the belt is a diatreme breccia pipe that is composed of xenoliths of a variety of igneous and sedimentary (mainly quartzite and carbonate) rock types and xenocrysts of chrome spinel in a pale green, carbonate-rich tuffaceous matrix. Exploration on the property in 2002 identified a lamprophyre dyke that varies in width from a few meters to over 50 meters and is exposed intermittently along strike for 2.5 km. A 32 kilogram surface sample of this dyke returned one transparent, green, cuboid micro-diamond measuring 0.38 x 0.30 x 0.25 millimeters.

REPORTED DIAMOND OCCURRENCES

Bonanza Creek, Dawson area

Jim Conklin, placer miner on upper Bonanza Creek, reports recovering 2 "match head-sized diamonds" from placer concentrates. He also recovered chrome-diopside and garnet from the concentrate. One of the diamonds has been mounted on a ring. He described the diamonds as "showing up" in the concentrate during his clean-up.

On lower Bonanza Creek, placer miner Kieran Daunt has described recovering abundant garnet and chrome-diopside in his concentrate. He has not seen any diamonds, yet.

Clear Creek, Dawson area

On Clear Creek, placer miner Nels Harper working with prospector Scottie Tom recognized the potential for alluvial diamonds in the area and installed a grease table on the end of their clean-up box below the jig. They recovered 6 small diamonds from this set-up in 1997. The diamonds were identified by Scottie Tom, however no confirmation exists. Tom has since passed away. Harper also reported that abundant garnets are present in their concentrates.

A study of heavy minerals from placer concentrates in the Clear Creek drainage (Allen, 1998) identified a number garnets and ilmenites and noted abundant lamprophyre boulders in the creek bed. The boulders are derived from east trending lamprophyre dykes which occur in the aureoles of plutons in the area (C. Hart, pers. comm.).

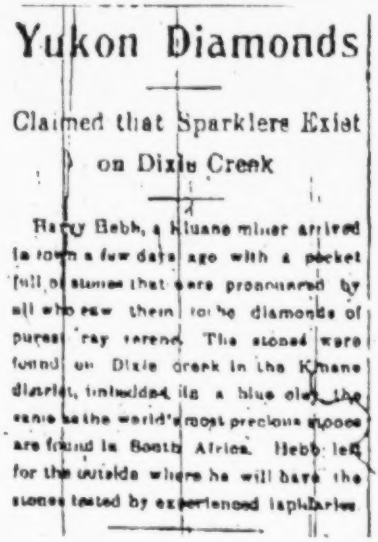
Dixie Creek, Kluane Area

The following article is from the Whitehorse newspaper The Weekly Star from October 5, 1906:

Yukon Diamonds

Claimed that Sparklers Exist
on Dixie Creek

Henry Hebb, a Kluane miner arrived in town a few days ago with a pocket full of stones that were pronounced by all who saw them to be diamonds of purest ???????. The stones were found on Dixie creek in the Kluane district, imbedded in a blue clay, the same as the worlds most precious stones are found in South Africa. Hebb left for the outside where he will have the stones tested by experienced lapidaries.



Yukon Diamonds

Claimed that Sparklers Exist
on Dixie Creek

Harry Hebb, a Kluane miner arrived in town a few days ago with a pocket full of stones that were pronounced by all who saw them to be diamonds of purest ray serene. The stones were found on Dixie creek in the Kluane district, imbedded in a blue clay, the same as the world's most precious stones are found in South Africa. Hebb left for the outside where he will have the stones tested by experienced lapidaries.

Dominion Creek, Dawson area

Dawson area prospector, Tom Morgan reported that 2 diamonds were recovered by Jim Moravec, a private gold buyer in the Dawson area. The diamonds were recovered from concentrates that Moravec purchased from placer mining operations on Upper Dominion Creek. Also recovered were garnet and chrome-diopside from Indian River area concentrates and garnets from Dominion Creek area concentrates. Numerous garnets were also recovered from placer concentrates on Lower Dominion Creek by Tara, Jim and Dagmar Christie at their operation, as well.

Lower and Upper Indian River, Dawson area

There are reports of at least 12 diamonds being recovered by various operators from several placer operations on the Indian River. Local prospector and placer miner, Pete Risby reported that gold buyer, Jim Moravec recovered 7 diamonds from concentrates purchased from Risbys' operation and Vern Estabrooks' operation on the upper Indian River in the mid 1980's. It is not known how many of the diamonds came from each. However, Risby supplied 3 batches of concentrate and Estabrook

supplied 2 batches. Risby also reported that Jim Congdon of Kodiak Mining was reported to have found some diamonds at his placer mine on the Indian River, but it is not known how many. Also, Dennis Foy, a placer miner on lower Indian River near Quartz Creek, recovered 1 diamond .

Also in the Indian River area, a number of placer miners have reported that a group of concentrate buyers known as International Separation Systems Incorporated (ISSI) from Kelowna, British Columbia were active in the area, purchasing concentrates from placer mining operations. The concentrates were processed using a proprietary system developed by ISSI. The samples were sent to C. F. Mineral Research for visual examination and are reported to have contained numerous chrome-diopside, olivine, black-, white-, green-, orange- and red garnets. Also, it is reported that at least 3 diamonds were recovered by ISSI, however this has not been confirmed.

Rosebud Creek, Dawson area

Whitehorse Prospector, and co-author of this report, Bill Harris has heard of a diamond being recovered from placer mining on Rosebud Creek many years ago. There is no recollection of who it was that recovered the diamond, or in what year it was recovered.

Wilson Creek, British Columbia

Placer miner, Marvin Sherman reported discovering a single diamond from his operation on Wilson Creek approximately 10 years ago. He described the diamond as about 1/4 inch flat gem with a rough, rounded shape and a yellowish white color. The stone was given to a professor at the University of British Columbia and positively identified, however he cannot recall the name of the professor, nor does he have a certificate verifying the identification. He did not notice any indicator minerals in his concentrate, however, he was not particularly looking for them.

Canyon Creek, Alaska

A single diamond was reported to have been recovered by Eric Kyle of Anchorage, Alaska from his placer operation on Canyon Creek, a right limit tributary of the 40 Mile River near the Yukon - Alaska Boundary. The diamond was found while cleaning placer concentrates.

Jack Wade Creek, Alaska

Don Kenzie, of Handle River Resources reports that a diamond was brought to him from a placer miner on Jack Wade Creek near Boundary, Alaska. It is believed the gem was recovered by an Anchorage area placer miner and prospector, Cy Brass. Brass reported an abundance of garnets of a variety of colors from his placer concentrates. The diamond was positively identified by Bill Harris by testing with a thermal inertia probe.

Turk Creek, Alaska

Norm Laframboise of Boundary Resources Inc. reports finding 3 alluvial diamonds from Turk Creek, 4.8 km south of Boundary, Alaska. For the past 12 years, his company has been exploring the area to locate the source of the diamonds. Exploration activities have included 64 line-km of airborne magnetic surveys, prospecting and till sampling. Till samples were submitted to C. F. Mineral Research in Kelowna and results include the discovery of G3 and G5 garnets and CP5 clinopyroxene, as well as the diamonds. As well, two samples of clay from the property were submitted to Grant Lowey of the Yukon Geology Program for analysis. They were identified as smectite, a product of weathering of mafic and ultramafic rocks, which are abundant in the area.

Mr. Laframboise reported that one of his diamonds was tested and confirmed by Lori Walton, Senior Mineral Development Advisor for the Yukon Department of Energy, Mines and Resources and another, which was in the possession of Grant Lowey, was tested and confirmed by Bill Harris.

Mr. Laframboise reports that the property has been examined by USGS Placer Geologist Warren Yeend, and geologists from BHP-Billiton, in 1989 and Kennecott, in 2001. The area was also the subject of a University of Alaska, Fairbanks Masters Thesis in 2000, although he has not seen the thesis.

Circle Diamonds, Alaska

Three diamonds have been found by placer miners on Crooked Creek near Circle, Alaska (Forbes, 1987). In 1982, placer miner Jim Regan reported the discovery of a small diamond that was recovered from concentrates. The diamond is described as a clear, rounded octahedron that weighs about 1/3 kt. The diamond was given to John Sims, former Director of the Alaska Department of Commerce and Economic Development, who forwarded it to DeBeers for positive identification. DeBeers later sent two associates to examine the alluvial and bedrock geology of the area but failed to produce additional diamonds, indicator minerals, or evidence of kimberlite or lamproite intrusions.

In 1984, placer miner Mary Warren discovered a 1.4 kt diamond during secondary clean-up work on concentrates from the Warren placer mining operation on Crooked Creek. The stone was positively identified by the Gemological Institute of America. It is a yellow-white pseudo-dodecahedron with numerous cresentic indentations on the crystal faces (Forbes, 1987).

The third stone found on Crooked Creek was discovered by Paul Manuel in 1986. It weighs 0.83 kt and is a light yellow, twinned dodecahedron. The diamond also has small percussion marks on the crystal faces. It was discovered during clean-up of riffle sets in the upper part of the sluice box (Forbes, 1987).

REPORTED POTENTIAL DIAMOND-RELATED OCCURRENCES

Adams Creek

Placer miner, Dan Trudeau described garnets and chrome-diopside being recovered from concentrates from his placer operation on Adams Creek in the Klondike area.

Big Gold Creek, Dawson area

On Big Gold and Little Gold Creek in the 60 Mile River area of the Dawson Mining District, Al and Laurie Downes have conducted several programs of geological mapping and sampling. They report recovering garnet and chrome-diopside from placer concentrates from their mining operation and that Kennecott has analyzed some samples. They also report observing green, montmorillonite clay in the creeks. Also found on the property is an olivine-bearing rock, which weathers to blue-green clay and is suspected to be kimberlite.

Caribou Creek, Dawson area

Placer miners, Roger Stuart and Jim Stuart described garnet and chrome-diopside being recovered from concentrates from their placer operation on Caribou Creek in the Klondike area.

Glacier Creek, Dawson area

Mike McDougall a placer miner on Glacier Creek in the 60 Mile River area reported recovering abundant garnets in his placer concentrates. These garnets were of many different colors including red, pink and orange, as well as clear, colorless minerals. He also reported finding occasional bright green minerals in his concentrates which fit the description of a chrome-diopside.

Jen Showing, Dawson area

The Jen Showing consists of a roughly circular 500 nT magnetic anomaly on the ridge between Calder and Little Blanche Creek, south of Dawson. Wayne Hawkes of Dawson has been exploring the area for diamonds for a number of years and has conducted ground magnetic surveys, geological mapping, heavy mineral sampling, till sampling and prospecting. He reports a number of lamprophyre dykes in the area and has sent samples of the dykes to Debeers for analysis. The samples contained a number of orange, red and green garnets, but no diamonds have been reported.

Kluane Area Dunites

According to local rumor in Haines Junction, Destruction Bay and Whitehorse, several diamond exploration companies including Debeers (Monopros) and Diamet Minerals Ltd. have explored the Kluane area intermittently over the past 10 years. The companies have conducted till sampling, surficial geological mapping and heavy mineral concentrate sampling programs, the focus of their work being the ultramafic rocks in the area. Reportedly they have returned several times to follow-up on their results.

Sulphur Creek, Dawson area

Mark Pearson, a placer miner on Sulphur Creek in the Klondike area, reported recovering abundant garnets in his placer concentrates. These garnets were of many different colors including red, pink and orange.

Teslin Area Dunites

According to local rumor in the Teslin, Atlin and Rancheria areas, several diamond exploration companies have been exploring in these regions, as well. Apparently they have been focusing on the mafic and ultramafic rocks in each of these areas.

Old Crow Blue Clay

The following is an excerpt from a letter written by a priest working at Fort Selkirk on the Yukon River during the time of the paddle-wheelers:

> "Andrew MacDonald told me that about 40 miles below La Pierres House or about 6 miles below the junction of the Bell and Porcupine Rivers on the right hand bank he saw mica in high mud bank 40 - 60 feet high. A little below this on the same side is blue mud in which diamonds are generally found."

CONCLUSION

It has become apparent while conducting this research that most of the diamond discoveries in the Yukon have occurred by accident, mainly by placer miners serendipitously coming across the gems while examining their clean-up. It is also apparent that senior diamond exploration companies, have been interested in these finds. It is rumored that a major diamond mining and exploration company conducted an extensive glacial till, bulk sampling program of gravel pits along the main highways throughout the Yukon. However, there appears to have been very few other diamond exploration companies that have conducted much in the way of serious, systematic exploration for the source of the gems.

In the Klondike and 60 Mile River areas, there are reports of at least 28 diamonds being found. This high proportion of discovery relative to the rest of the territory may, in part, be due to the amount of exploration and placer mining activity conducted in this area. Elsewhere, in placer mining camps in the Kluane and Atlin areas and in Alaska, there have been discoveries, but not to the same degree. Other parts of the territory that have not seen the same level of activity may be equally prospective.

Companies interested in exploring for diamonds in the territory may be wise to contact the placer miners to obtain samples of their concentrates. The placer miners are conducting some of the largest till/soil sampling and heavy mineral processing programs in the north. Systematic analysis of indicator minerals and screening for diamonds in these operations may provide insight into the diamond potential of the Yukon. Another tool for the diamond explorationist, especially in the areas where diamonds and indicators have been recovered, is to use the government airborne magnetic data to look for kimberlitic and/or lamproitic magnetic responses to help locate the source of the gems.

ACKNOWLEDGMENT

The authors would like to acknowledge all of the individuals who willingly contributed their time, information and rumors to this publication. Special thanks to Lori Walton of the Department of Energy Mines and Resources for her "leads", guidance and support on this project.

REFERENCES

Allen, T. L., Hart, C. J. R. and Marsh, E. E. Placer Gold and Associated Heavy Minerals of the Clear Creek Drainage, Central Yukon: Past to Present. In; Yukon Exploration and geology 1998, C.F. Roots and D.S. Emond (eds), Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, p. 197-214.

BC Minfile, # 094L 017, Geological Survey Branch, BC Ministry of Energy Mines and Petroleum Resources, Website www.em.gov.bc.ca/Mining/Geolsurv/Minfile.

DIAND, 2000. Yukon Minfile. Exploration and Geological Services Division, Indian and Northern Affairs Canada.

Forbes, R. B., Kline, J. T. and Clough, A. H., 1987. A Preliminary Evaluation of Alluvial Diamond Discoveries in Placer Gravels of Crooked Creek, Circle District, Alaska. Alaska Division of Geological and Geophysical Surveys, Report of Investigations 87-1.

Golconda Resources Ltd.,Website www.golcondaresources.com

Normin Database, # 106ASW0001, Department of Indian Affairs and Northern Development, Website www.nwtgeoscience.ca/normin.

Pacific Ridge Exploration Ltd, 2002. Summary Report on the Xeno Property. Private company report.

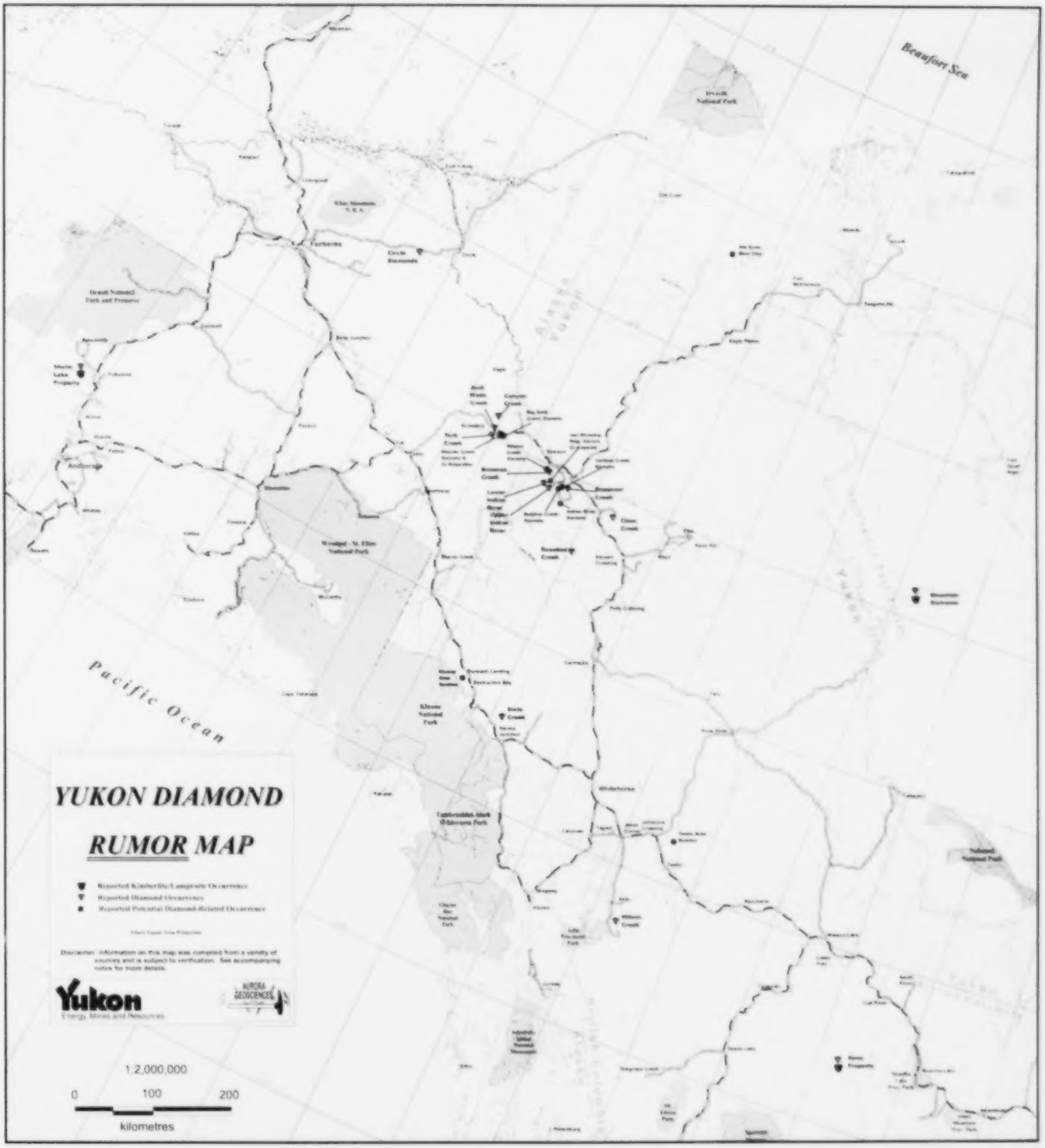
Pacific Ridge Exploration Ltd, Company Press Release, March 13, 2002, Website www.pacificridgeexploration.com

Shear Minerals Ltd., Company Press Releases, July 8 and September 6, 2002, Website www.shearminerals.com

Swainbank, R. C., Szumigala, D. J. 2002. Alaska Mineral Industry 2001: A Summary: In Alaska Division of Geological and Geophysical Surveys, Information Circular 48, p. 8.

The Weekly Star, 1906. Article from Whitehorse newspaper dated October 5.

Walton, L., 1996. Exploration Criteria for Gemstone Deposits and their Application to Yukon Geology, Exploration and Geological Services Division, Indian and Northern Affairs Canada. Open File 1996-2(G).


Beaufort Sea
Pacific Ocean
YUKON DIAMOND
RUMOR MAP
Reported Kimberlite/Lamproite Occurrence
Reported Diamond Occurrence
Reported Potential Diamond-Related Occurrence
Disclaimer: Information on this map was compiled from a variety of sources and is subject to verification. See accompanying notes for more details.
Yukon
Energy, Mines and Resources
AURORA GEOSCIENCES
1:2,000,000
0
100
200
kilometres